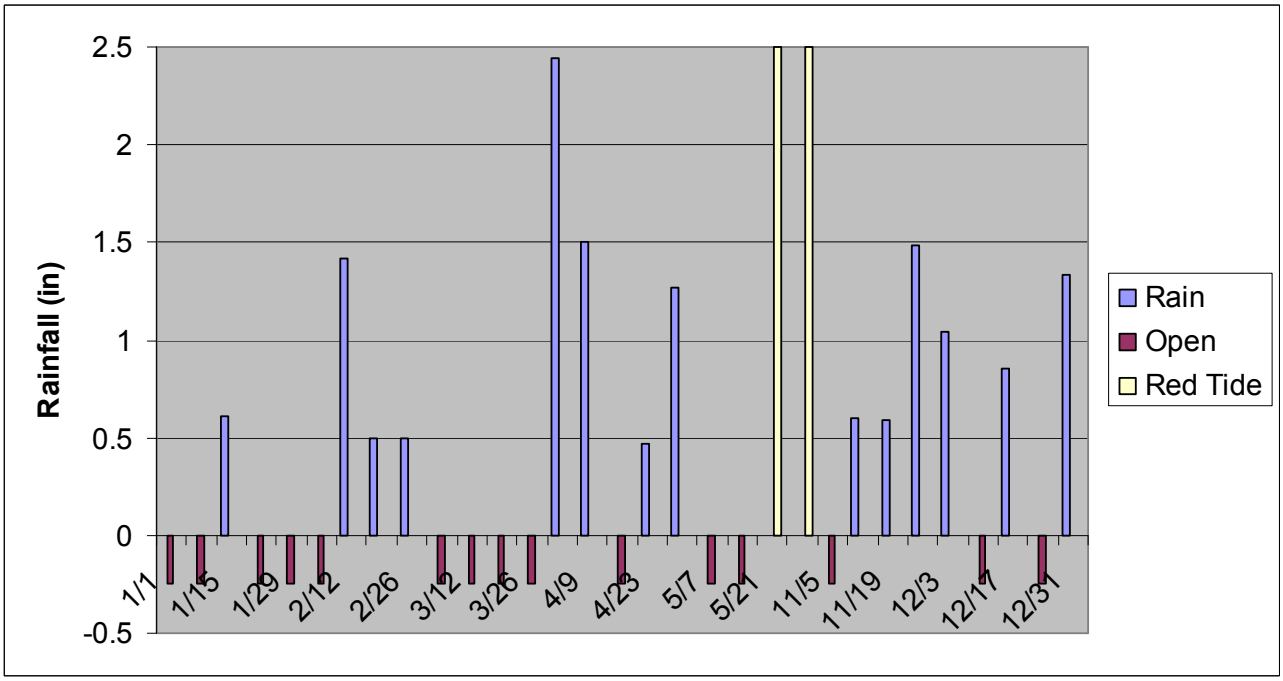
CLOSURES

Rainfall/Conditional Closures

In 2005, areas classified as "Conditionally Approved" for rainfall and/or WWTF performance were some sections of Hampton/Seabrook Harbor (rainfall closure threshold of 0.25 inches), portions of Little Harbor (rainfall closure threshold of 0.50 inches), and portions of Great Bay and Little Bay (rainfall closure of 1.50 inches). Portions of the Bellamy River were reclassified as Conditionally Approved in late 2005, but a series of rainfall events in excess of the one-inch closure criterion kept the area closed for the balance of the calendar year. Figures 7 and 8 depict the pattern of open/closed weekends for calendar year 2005 in Hampton/Seabrook and Little Harbor, respectively. Blue bars represent weekends when the area was closed to harvesting due to rainfall, with the size of the bar indicating the amount of rain that caused the closure. Red bars depict weekends that were open for harvesting.

Figure 7: Hampton/Seabrook Rainfall Closures for 2005 Weekends

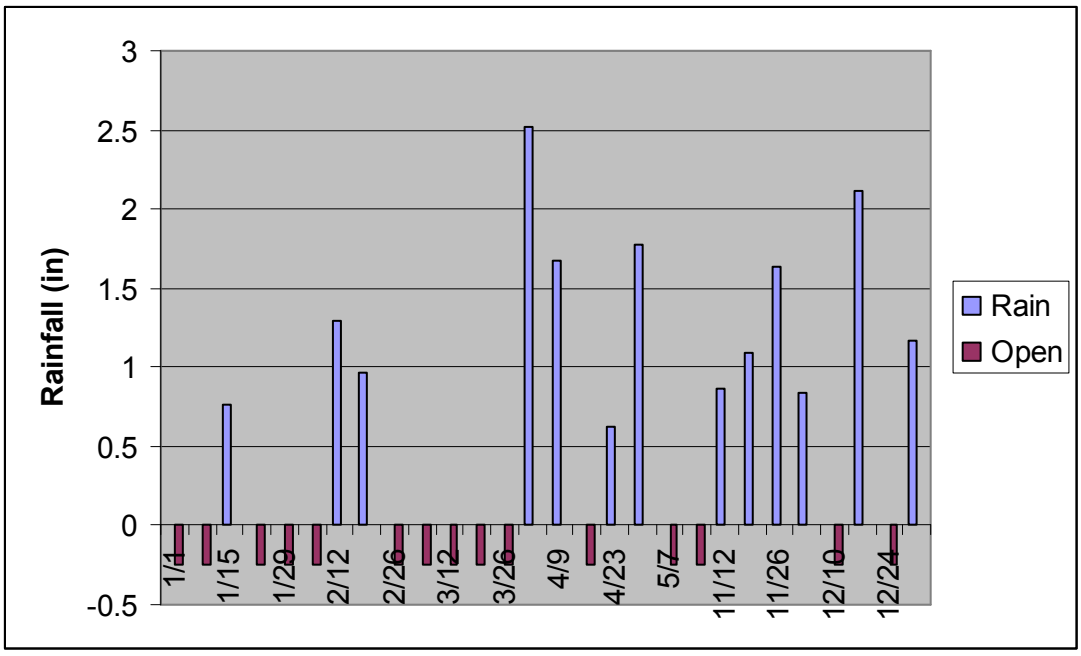


Note: the 5/28/05 closure was due not only to red tide, but also because of over five inches of rain from 5/21/05 to 5/27/05.

Weather conditions in early 2005 were relatively favorable for harvesting opportunities, but less favorable later in the year, especially in late spring and mid/late fall. Of the 31 days during the January-May and November-December open season in Hampton/Seabrook, 15 days (48 percent) were open for harvesting (53, 45, and 48 percent in 2004, 2003, and 2002, respectively). All but one of the rainstorms that caused a closure were over 0.50" of rainfall. One of the worst outbreaks of red tide, or Paralytic Shellfish Poisoning in the Gulf of Maine affected Hampton Seabrook in the last two weeks of May. A total of 15 sampling runs were conducted after the rainfall events that caused a closure. Ten of these runs produced data that supported opening the flats before the typical 14-day closure period had elapsed.

In Little Harbor, there were 28 weekends during which harvesting could have occurred (January to mid-May, November-December). A total of 15 days, or 54 percent, were open for harvesting (59 percent in 2004, and 38 percent in 2003). Eight of the 12 rainfall closures were triggered by storms of over one inch of rainfall. A total of seven sampling runs were conducted after the rainfall events that caused closures. Four of these runs produced data that supported opening the flats before the typical 14-day closure period had elapsed.

Figure 8: Little Harbor Rainfall Closures for 2005 Weekends



Rainfall closures also affected Great Bay and Little Bay, although these are less frequent because of a relatively high rainfall closure threshold of 1.50 inches. These areas were placed in the closed status for rainfall three times:

- Over 1.5 inches of rain on April 28, 2005 put the area in a rainfall closure for the period of April 28 to May 5.
- Over four inches of rain on October 8, 2005 put the area in a rainfall closure for that day. The following day a sewage overflow closure took effect, after the rainfall triggered a CSO event in Exeter.
- Over 1.5 inches of rain on November 22, 2005 put the area in a rainfall closure. The area stayed in the closed status for the next several weeks because of a series of rainfall events. On December 16, 2005, a sewage overflow closure took effect, after heavy rainfall triggered a CSO event in Exeter.

Emergency Closures

There was an unusually large number of heavy rainfall events in both spring and fall in 2005, some of which caused sewage overflows from municipal wastewater treatment facilities and/or sewage collection infrastructure. Closed status sampling (water and shellfish tissue) is initiated after such closures to determine when a reopening of the growing area is appropriate. Closures attributable to rainfall (no associated sewer discharges) were described in the previous section. Sewage discharge events that triggered an emergency closure are summarized in Table 1.

Table 1 lists the emergency closures related to sewage overflows from wastewater treatment facilities or sewage collection infrastructure implemented in 2005. Note that harvesting in Hampton Harbor and Little Harbor is limited to Saturdays only during the open season.

Table 1: WWTF-Related Emergency Closures Implemented in 2005

Area	Rainfall or Sewage Discharge Event	Dates Closed to Harvesting
Great Bay, Little Bay Atlantic Coast, Hampton, Little Harbors	3/29/05: 523,000 gallon combined sewer overflow from Exeter following heavy rain. Additional 129,000 gallon CSO following rainfall on 4/3/05 3/29/05: all other areas closed for harvest due to rainfall in excess of 2.50 inches)	3/29/05-4/13/04 for Great Bay, Little Bay; 3/29/05 – 4/7/05 for Atlantic Coast 4/2/05, 4/9/05 for Hampton 4/2/05, 4/9/05 for Little Harbor
Great Bay, Little Bay	5/24/05: 875,000 gallon combined sewer overflow from Exeter following heavy rain. Note: Over 5 inches of rain fell in the last week of May, but emergency closures were not in effect for several areas: Little Harbor was already under seasonal closure for boat sewage risk. Hampton Harbor and the Atlantic Coast were already under a PSP/Red Tide closure.	5/24/05-6/10/05
Great Bay, Little Bay	8/28/05: 1,000,000 gallon combined sewer overflow from Exeter following a pump station failure	8/29/05-9/2/05
Great Bay, Little Bay Atlantic Coast	10/9/05: 19,000 gallon combined sewer overflow from Exeter following heavy rain on 10/8/05 10/15/05: 383,600 gallon combined sewer overflow from Exeter following heavy rain 10/25/05: 412,000 gallons combined sewer overflow from Exeter following heavy rain Closed for harvest due to rainfall in excess of 2.50 inches 10/8 rainfall of ~4 inches, and 10/25 rainfall	10/8/05 – 11/11/05 10/8/05 – 11/4/05

Area	Rainfall or Sewage Discharge Event	Dates Closed to Harvesting
	of ~4 inches) Note: October rains did not warrant emergency closure of Hampton Harbor or Little Harbor, as both areas were still under seasonal closure for boat sewage risk.	
Great Bay, Little Bay	12/16/05: 186,600 gallon combined sewer overflow from Exeter following heavy rain	12/16/05 – 12/23/05

Paralytic Shellfish Poisoning Closures

As previously noted, the 2005 PSP season was one of the most severe on record, with record levels of toxicity in New Hampshire shellfish. The size of the areas affected, and the length of time that affected areas had to be kept closed to harvesting, was unprecedented (the reader should note that data from neighboring states indicates a PSP event in the early 1970s was just as severe, if not more so, than the 2005 event; however, no data on shellfish toxicity or closures in New Hampshire are available for that event). A total of 87 samples were collected in 2005, as compared to a typical sampling year of approximately 60 samples. A summary of the PSP closures affecting New Hampshire waters in 2005 is as follows:

- Offshore Atlantic waters closed to all harvesting for the period of 5/5/05 to 7/26/05 (85 days). The harvesting activity in this area affected was the offshore mussel aquaculture operation located approximately one mile south of White Island.
- Nearshore Atlantic waters closed to all harvesting on 5/19/05. The closure affecting blue mussels was lifted on 7/21/05 (64 days), but the harvest ban on surf clams was initially lifted on 9/21/05 (126 days). Surf clam harvesting was suspended in early October due to heavy rainfall. By early November the high bacteria levels from the October rainfall events had subsided, but precautionary surf clam sampling for PSP began to show elevated residual toxin levels. Data from other monitoring in New Hampshire and from neighboring states indicated that these elevated levels were not the result of a new PSP bloom, but rather was likely the result of inherent variability in the PSP test itself, coupled with some residual levels of toxin. As a precaution, the closure of surf clam areas initially implemented after the October rainfall events was continued through early December. The closure was lifted after low PSP toxin results were observed over several consecutive weeks.
- Hampton/Seabrook Harbor was closed for harvest on the last two Saturdays of May (5/21/05 and 5/28/05). The area was closed not only for high PSP levels, but also because of rainfall events in excess of the 0.25-inch closure threshold. Although PSP levels began dropping in this area in mid June and had dropped to background levels by mid July, the area was under its typical seasonal closure for the period of June through October.

Seasonal/Marina Closures

Areas with large concentrations of boats (marinas and mooring fields) pose a seasonal risk of sewage contamination. Some of these marinas/mooring fields are adjacent to shellfishing areas that are available for harvest on a conditional basis. Weekly surveys of the number of boats present (especially those likely to have sanitary waste disposal equipment) determine when these areas are seasonally opened and closed. Table 2 summarizes the dates when conditionally approved areas were closed and reopened as a result of these surveys.

Table 2: Seasonal Closures and Reopenings Adjacent to Marinas and Mooring Fields

Area	Date Closed	Date Reopened	Comments
Hampton/Seabrook	6/1/05	10/31/05	Boat survey on 5/16/05 indicated seasonal closure not yet needed. Area closed for rainfall and red tide the following two weekends, after which clamming season ended. Boat survey on 6/1/05 showed number of boats almost at level requiring seasonal closure. Area remained closed until fall. Boat survey on 10/31/05 indicated that a sufficient number of boats had been hauled out; area opened on 11/5/05.
Little Harbor	5/14/05	10/31/05	Boat survey on 5/9/05 indicated fresh water to all slips at Wentworth Marina was turned on; seasonal closure implemented for the following weekend on 5/14/05. Water turned off at all slips for the season on 10/31/05. That, plus the number of vessels being secured/shrinkwrapped, indicated the risk for boat sewage contamination was minimized.
Lower Little Bay	6/11/05	7/28/05	On 7/29/05, a new classification was adopted to include a new Prohibited area sized to accommodate potential boat sewage risk at full occupancy for significant boating areas in Lower Little Bay. This Prohibited area eliminates the need for seasonal closures.
Upper Little Bay	-----	-----	None needed. Spring/summer boat surveys showed less than 10 boats with heads through 7/26/05. On 7/29/05, a new classification was adopted to include a new Prohibited area sized to accommodate potential boat sewage risk at full occupancy for significant boating areas in Upper Little Bay. This Prohibited area eliminates the need for seasonal closures.